

Comparison of endometrial polyp recurrence in fertile women after office hysteroscopic endometrial polypectomy using two widely spread techniques

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Abstract

Aim: To compare the recurrence of benign endometrial polyps after office hysteroscopic polypectomy performed with a bipolar electrode (BE) or a small diameter hysteroscopic tissue removal system (HTRs).

Methods: From July 2018 to December 2019 we evaluated the charts of 114 asymptomatic fertile women who underwent office hysteroscopic polypectomy, 1 year before, for a single large benign endometrial polyp (size between 10 and 20 mm) using a 4 mm continuous flow hysteroscope with a BE or a 5 mm HTRs. Patients, divided into two groups according to surgical procedure, each performed exclusively by one expert gynecologist, were scheduled for a 12-month postoperative transvaginal sonography to evaluate the recurrence of endometrial polyps.

Results: Forty-eight women of the BE group and 42 of the HTRs group were considered for the 1-year transvaginal sonography follow-up. Five polyps were identified in the BE group and three in the HTRs group (5/48 vs 3/42, $P = n.s.$). All polyps were removed hysteroscopically (in three out of five and in two out of three cases, respectively, in the same places of the previous polypectomy) and evaluated as 'benign' by the pathologist.

Conclusion: Office hysteroscopic endometrial polypectomy with small HTRs compared to BE revealed at a 1-year follow-up no difference in terms of complete removal and recurrence of polyps. HTRs polypectomy resulted in less pain and significantly quicker time of procedure compared to BE. This data should be kept in mind for patient comfort any time hysteroscopic polypectomy is planned in an office setting.

Key words: bipolar electrode resection, endometrial polyp, hysteroscopic tissue removal system, TruClear system, Versapoint system.

Introduction

Endometrial polyps are defined as localized hyperplastic overgrowth of endometrial glands and stroma around a vascular core that project from the surface

of the endometrium.¹ They are a common gynecologic pathology, with an incidence of up to 24–41% in women with abnormal uterine bleeding or infertility and in 10% of asymptomatic women.^{2,3} Endometrial polyps can appear as a single or multiple growths,

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Videos of the two hysteroscopic techniques are available online: <https://www.youtube.com/watch?v=1efAc8Q3sAY> (Endometrial polypectomy with Bipolar Electrode); <https://www.youtube.com/watch?v=WzMfkAhh7xk> (Endometrial polypectomy with HTRs).

sessile or pedunculate, and range in size from millimeters to centimeters.

Transvaginal sonography (TVS), sonohysterography (SHG) and hysteroscopy are the usual tools to diagnose endometrial polyps with similar specificity and sensibility.²

Hysteroscopic polypectomy represents the gold standard for polyp treatment. In recent years, the improved hysteroscopic technology has been enabled gynecologists to perform polypectomy in an office setting using mechanical instruments (grasping forceps, micro-scissors), bipolar or monopolar electrode and tissue removal blade.⁴

Since 2002, the feasibility of office-based polypectomy with disposable bipolar electrode (BE) (type Twizzle, Versapoint, Gynecare) has been described, allowing the possibility to excise endometrial polyp less than 2 cm.⁵

In recent years, an innovative hysteroscopic tissue removal system (HTRs) based on mechanical removal of intrauterine lesions has been developed.⁶ Currently, several HTRs are in the market and similar in structural design, and they all consist of a hand piece, core powered instrument driver, footswitches and different size blades adaptable to be introduced in the working channel of 5 to 9 mm hysteroscope.⁷ This new technology simultaneously cuts and removes the tissue improving visibility and reduces the need for multiple equipment insertions. Since 2012 the use of a small HTRs (5.6 mm in diameter) (TruClear 5C System, Medtronic) has been shown to be effective, fast and easily learned and recently, large endometrial polyps (≥ 2 cm) have been treated in an office setting.⁸

After hysteroscopic polypectomy the recurrence rate of endometrial polyps has been shown to range from 2.5 to 45.5%, depending on their number, follow-up duration and the nature of polyps.^{9–13} To date, there is still a lack of evidence of polyp recurrence according to the hysteroscopic technique used.¹³

The present study was designed to compare the recurrence rates of endometrial polyps after polypectomy performed using BE or small HTRs in an office setting with the vaginoscopic approach.

Methods

From July 2018 to December 2019 we evaluated the charts of 114 asymptomatic fertile women, eligible for the study, who underwent an office hysteroscopic polypectomy for a single large (between 10 and 20 mm) benign endometrial polyp 1 year previously

at the Second Unit of Obstetrics and Gynecology, University of Bari, Italy. All women were without known risk factors for endometrial polyp recurrence.⁴

The diagnosis of endometrial polyps was previously made by two-dimensional transvaginal ultrasonography, routinely performed during our gynecologic evaluation, and the polyps were measured after obtaining longitudinal plane of the uterus with saline infusion sonogram.²

Immediately after ultrasound diagnosis of an endometrial polyp, according the guidelines for the treatment of endometrial polyps >10 mm, operative hysteroscopic polypectomy was undertaken excluding also any other coexisting pathology in the uterine cavity.^{4,14,15}

All the hysteroscopic procedures were carried out by two senior gynecologists (E.C., O.C.) in an office setting with a vaginoscopic approach (without local anesthesia, analgesia or any other drugs administered), in the early proliferative phase. Each surgeon only used the technique in which he was most skilled (E.C. for the BE group and O.C. for the HTRs group). Therefore, patients randomly underwent polypectomy based on the surgeon experience.

In 61 out of 114 women (BE group) polyps were removed using a 4-mm diameter continuous-flow hysteroscope with oval profile and a 30° fore-oblique telescope and a 5 Fr operating channel (Office Continuous Flow Operative Hysteroscope 'size 4', Karl Storz). The 5 Fr BE (type Twizzle, Versapoint, Gynecare) was introduced in the operative channel and connected by a flexible cable to a generator that was automatically set to Vapor Cut 3, corresponding to the mildest energy flowing into the tissue, and also reducing by half the power setting to 50 W (VC3-50).⁵ Polyps were sliced from the free edge to the base into two/three fragments, large enough to be pulled out through the uterine cavity using 5 Fr grasping forceps with teeth (Figs 1,S1). To remove the entire base of the polyp without going too deep into the myometrium, in some cases, the Twizzle electrode was bent by 25°–30°, enough to obtain a kind of hook electrode. Distension of the uterine cavity was obtained with saline solution (NaCl 0.9%), using an electronic suction-irrigating pump (Endomat, Karl Storz). A stable intrauterine pressure of approximately 40 mmHg was obtained by setting the flow rate at 300–350 mL/min, the negative pressure suction at 0.2 bar and the pressure of irrigation at 100/120 mmHg.

In 53 out of 114 women, the polypectomy was achieved by using a 5.6 mm oval profile HTRs

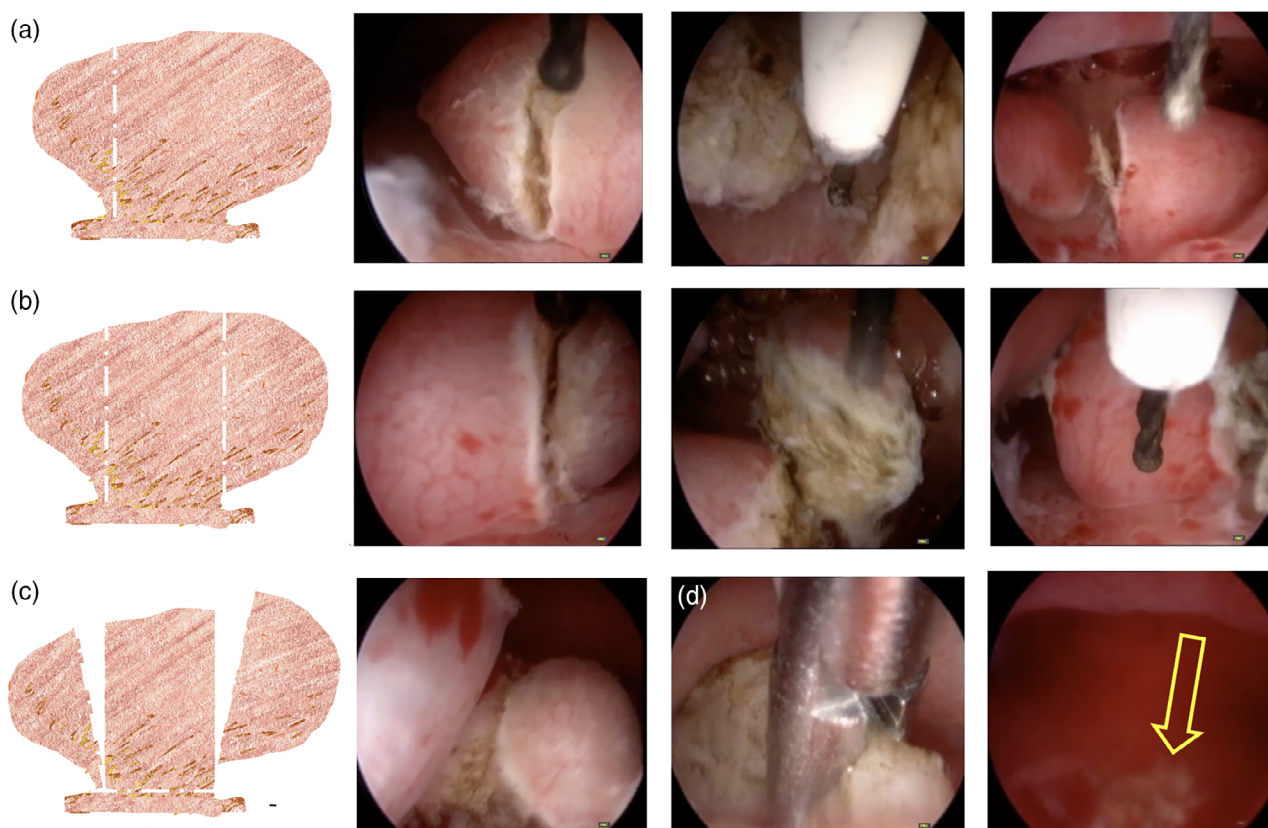


Figure 1 Slicing technique to treat large endometrial polyp with bipolar electrode. (a) Incision of the slice on the right; (b) incision of the slice on left; incision of the base; removal of the fragments with the grasping forceps. Yellow arrow indicates the completely removal of polyp stalk.

TruClear 5C System, Medtronic) with a 2.9-mm blade (Fig. 2).

The small HTR system consists of a continuous flow hysteroscope with an overall diameter of 5.6 mm with an optic size of 0.8 mm. The 2.9-mm small size blade of HTRs (a rigid inner tube, with cutting edges, that rotate within an outer tube, incorporating a 5 mm length side facing cutting window at its distal end) was introduced in the 3.1 mm operative channel of oval profile hysteroscope (Fig. S2). Before beginning the procedure, to reduce the scope diameter to 5 mm, the outer sheath was removed, and the blade was secured to a reusable handpiece. The handpiece has two ports: one connected through a canister to a suction source to aspirate removed tissue; the other to a motor control unit. Polyps were captured in the cutting window as the inner tube rotated at 1200–1500 revolutions per minute (rpm) and cut them into small fragments. A suction-irrigating unit (Endomat, Karl Storz) was used to provide a positive pressure of

100/120 mmHg and a continuous flow control of 300–350 mL/min, and to apply to the inner tube a suction pressure 250–300 mmHg.

Location, size, and type of polyps was documented to compare the recurrence rate of the two procedures using an image and data acquisition (Aida system Karl Storz).

For all procedures, time taken to complete the endometrial polypectomy (defined as the time from the beginning of the polypectomy to the complete removal of the pathology), the completeness of the procedure without evidence of polyp remnants within the uterine cavity, the complications (pain, vasovagal reaction, excessive bleeding) and quality of pathological specimens was recorded.

Pain intensity experienced during the procedure by the women, was evaluated immediately after the polypectomy, using a 10-point numeric pain visual analogic scale (VAS score: 0–4 no discomfort or like normal menstrual pain, 5–7 moderate pain like heavy menstrual pain, 8–10 severe pain).

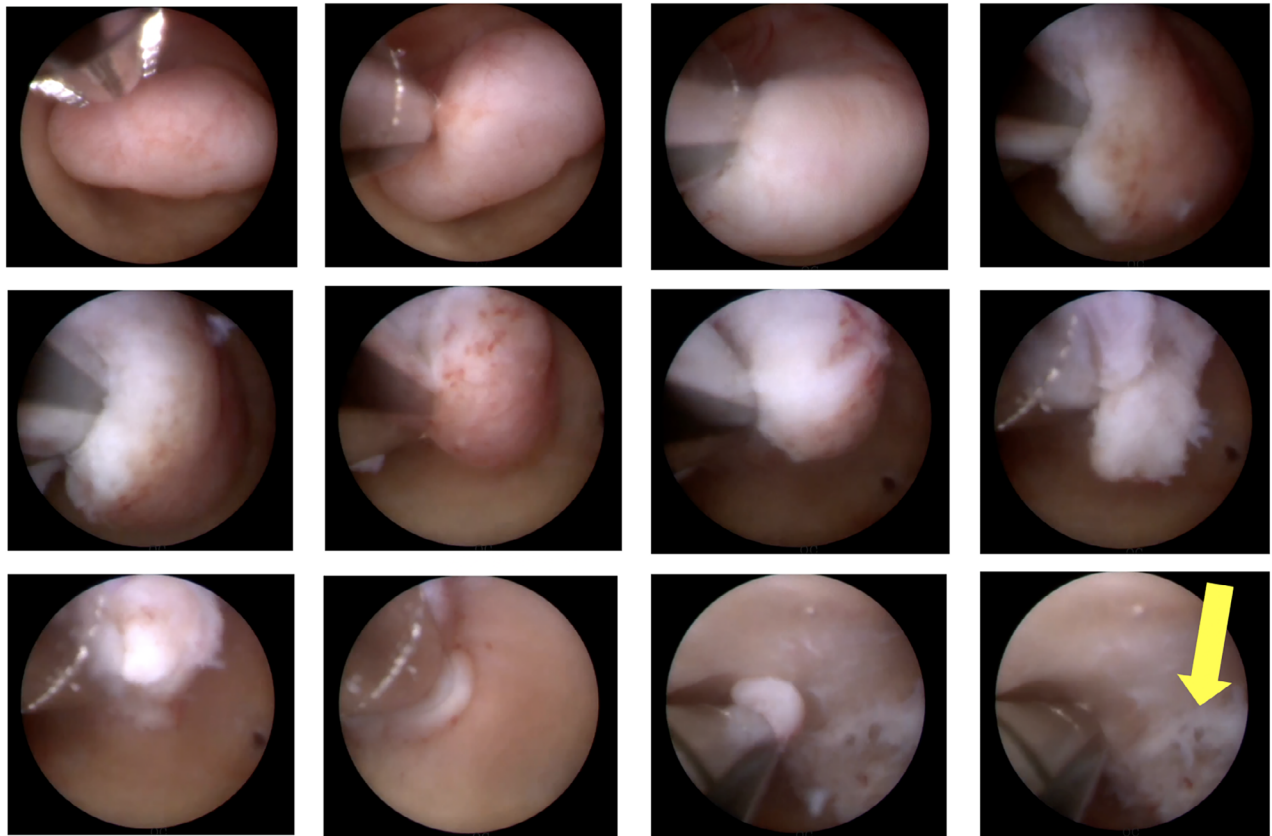


Figure 2 TruClear 5C treatment of a large endometrial polyp with the base near the right tubal ostium. Yellow arrow indicates the completely removal of polyp stalk.

Only women who had not been pregnant after the polypectomy were considered eligible for the study. Women who were receiving any hormonal therapy (for contraception or ovarian stimulation) were excluded from the study.

Forty-eight women of the BE group and forty-two of the HTRs group were eligible for the evaluation with a 1-year TVS follow-up. All TVS evaluations, with the addition of color Doppler to demonstrate the single feeding vessel typical of endometrial polyp were performed in a standardized manner. Polyps were measured after obtaining longitudinal plane of the uterus with saline infusion sonogram.² If an endometrial polyp was suspected, a hysteroscopy was performed to confirm the data.

Demographic and clinical data of the study population, endometrial polyp characteristics (size, location and type – sessile or pedunculate) were collected.

Institutional Ethic Committee approval was obtained (no. 5613, June 6, 2018) for the 1-year follow-up designed for the study, while the office hysteroscopies

with endometrial polypectomies were part of the routine clinical practice in our center.

Statistical analysis

Analyses were conducted with software R-3.5.2. Continuous variables were expressed as mean \pm standard deviation, and categorical variables as absolute and percentage frequencies.

To compare the continuous variables between the two treatment groups (BE and HTRs) the Welch *t*-test was used, while for the categorical ones, the exact Fisher test was used. The level of statistical significance was set at 0.05.

Results

Demographic and clinical characteristics of the study population, eligible for the study, are summarized in Table 1. The two groups did not differ significantly as regards age, body mass index (BMI), obstetric history.

Polyps were completely removed in 57 (93.4%) out of 61 of the BE group and in 50 (94.3%) out of 53 of the HTRs group. Seven out of 114 women, four in the BE group and three in the HTRs group, had needed to be treated in the operating room by resectoscopy because the polyps could not be completely removed owing to patients' discomfort (BE group) or their highly dense structure (HTRs group) and were excluded from the study.

Table 1 Summary of demographic and clinical characteristics of the study population

Study population	Surgical procedure		
	BE	HTRs	P-value
Women (<i>n</i>)	61	53	
Office endometrial polypectomy	57 [†] (93.4%)	50 [‡] (94.3%)	
Women at 1-year follow-up	48	42	
Age (years), mean ± SD	41.4 ± 5.7	40.8 ± 5.7	n.s.
BMI (kg/m ²), mean ± SD	25.2 ± 4.2	26.5 ± 5.1	n.s.
Parity (<i>n</i>)			
0	7	9	
1	24	22	
≥2	17	11	
Cesarean section, <i>n</i> (%)	11 (22.9%)	10 (23.8%)	

[†]Four cases were treated in the operating room; [‡]Three cases were treated in the operating room. BE, bipolar electrode; BMI, body mass index; HTRs, hysteroscopic tissue removal system; SD, standard deviation.

Twelve women successfully achieved pregnancy during the year after the polypectomy while five patients refused to participate in the study.

Ninety not pregnant women, 48 of the BE group and 42 of the HTRs group were considered for the evaluation with a 1-year TVS follow-up.

The median time for polypectomy was significantly longer for the BE group (8.5 ± 6.8 min) compared to 3.4 ± 4.2 min for the HTRs group, $P < 0.05$. The overall mean VAS score, measured immediately after polypectomy, was 3.0 ± 1.4 for the BE group and 2.1 ± 1.5 for the HTRs group, with no significant difference ($P = \text{n.s.}$). Seven (14.6%) out of 48 women of the BE group reported moderate pain (VAS score between 5 and 7). No serious surgical complications and no vasovagal reactions or bleeding occurred for either group.

Five (10.4%) single polyps (size from 10 to 15 mm) were identified out of 48 women of the BE group and three (7.1%) polyps (size from 12 to 16 mm) out of 42 of the HTRs group women. The comparison of the polyp recurrence rate in the two groups was not statistically significant ($P = 0.99$).

Comparing the previous images, three recurrent polyps in the BE group and two in the HTRs group were in the same position as those removed 1 year before. All recurrent polyps were hysteroscopically removed and confirmed as 'benign' by the pathologist. No other coexisting pathology was detected in the uterine cavity during hysteroscopic evaluation.

Polyps' characteristics (location, size and type), surgical procedure and results are summarized in Table 2.

Table 2 Polyp characteristics, surgery data and patient self-reported pain score

	BE	HTRs	P-value
Polyp size, mm			
10–15	27 (56.2%)	16 (38.1%)	
16–20	16 (43.8%)	26 (61.9%)	
Polyp type			
Pedunculate	22 (45.8%)	25 (59.5%)	
Sessile	26 (54.2%)	17 (40.5%)	
Polyp place in the uterine cavity			
Anterior/posterior wall	24 (50.0%)	19 (45.3%)	
Lateral wall	17 (35.4%)	15 (35.7%)	
Fundus or near tubal ostium	7 (14.6%)	8 (19.0%)	
Time (min), mean ± SD	8.5 ± 6.8	3.4 ± 4.2	<0.05
Pain (VAS score = 5–7)	7 (14.6%)	0 (0.0%)	<0.01
Recurrence	5/48 (10.4%)	3/42 (7.1%)	n.s.
Same place	3/48 (6.2%)	2/42 (4.8%)	n.s.

BE, bipolar electrode; HTRs, hysteroscopic tissue removal system; SD, standard deviation; VAS, visual analogic scale.

Discussion

Limited data are available in the literature exploring risk factors for endometrial polyp recurrence. Postoperative recurrence rates range from 2.5 up to 45.5%, depending on polyps' number, duration of follow-up, nature of polyps and surgical technique used.^{9–13}

Since multiple and/or hyperplastic polyps without atypia have a higher documented risk of postoperative recurrence than single and benign polyps (45.5% vs 13.4%) and (43.6% vs 8.3%) respectively, we considered only, asymptomatic women, in reproductive age, with a single benign polyp after predictive risk factors associated with polyp recurrence were excluded.^{9–11}

According to AAGL practice guidelines for the diagnosis and the management of endometrial polyps, visualization and direct removal of the pathology is reported to be effective and reduce the recurrence rate compared with the use of vision and removal by polypectomy forceps.⁴ The complete excision of polyp stalk is necessary to avoid the possible recurrence of endometrial polyp.⁹

In this study, we evaluated the recurrence of endometrial polyps after hysteroscopic polypectomy performed in an office setting by skilled surgeons with two widely used techniques, BE and HTRs that allow, under vision, to cut or remove the polyp at the base preserving at the same time the surrounding endometrium and avoiding deep injury to the myometrium to prevent the formation of intrauterine adhesions.^{5,8}

After 1-year, eight out of 90 (8.9%) women who completed the follow-up experienced polyp recurrence. The recurrence rate in the BE group was higher at 10.4% compared to 7.1% of the HTRs group, but not statistically significant ($P = 0.99$).

Our recurrence rate was lower than those reported in two recent studies concerning the recurrence of endometrial polyps.^{10,11} The high percentage of polyp recurrence described by Yang *et al.* could be related to the removal of all endometrial polyps with the resectoscope cutting-loop without energy to avoid thermal damage.¹⁰ In Gu *et al.*'s study, the polypectomy was performed with the use of a small ovum forceps for blunt removal with the help of hysteroscopy for targeting the endometrial polyps.¹¹

These two mechanical techniques might not completely remove the stalk and base of endometrial polyps, which enhanced the risk of polyp recurrence potential at the same location.^{10,11}

In our study, at the 1-year follow-up, five single polyps (size from 10 to 15 mm) were detected in the BE group and three single polyps in HTRs group (size 12 and 16 mm). Comparing the images of the first procedure, three of these polyps were in the same position as those removed 1 year before in the BE group and two in the HTRs group (Table 2).

Since the three polyps of BE group were flat and located in the fundus of the uterine cavity, and the two of HTRs group had the basis into tubal ostium, the recurrence could be linked to an incomplete stalk removal. The recurrence of the other polyps diagnosed 1 year later, two polyps of BE group and one of HTRs group, in different places respect the first polypectomy, could be linked to a persistent patient's condition.

Traditionally, the pathogenesis of endometrial polyps is thought to be related to an imbalance in ovarian steroids and to an abnormal estrogenic stimulation.^{16,17} Furthermore, a significant difference in the cycle-dependent inhibin expression has been demonstrated in a normal endometrium and polyps, suggesting that endometrial polyps may be tumors of dysregulation with mainly proliferating characteristics, being unable to synchronize with the normal endometrium.¹⁸ Recent studies have shown that an abnormal expression of 'local' paracrine inflammatory mediators may enhance the proliferation of endometrial mucosa, supporting the hypothesis that polyps represent an evolving stage of chronic endometritis.¹⁹ Therefore, endometrial polyp does not represent a homogeneous population: one hormone dependent and the other of an inflammatory nature. This different nature may result in different symptoms, oncologic consequences and risk of recurrence. In the present study we do not have a number of patients to allow us to arrive at definitive conclusions.

The median time for polypectomy, defined as the time from the beginning of the polypectomy to the complete removal of the pathology from the uterine cavity, was significantly longer for the BE group (8.5 ± 6.8 min) compared to 3.4 ± 4.2 min for the HTRs group, $P < 0.05$. The significant difference in operative time linked more to additional maneuvers necessary to retrieve fragments with forceps from the uterine cavity than to surgeon skill because the surgeon (E. C.) had been performing hysteroscopic polypectomy using BE during last 20 years. Moreover, the reduced operative time with HTRs was linked more to the simultaneous cutting and removal

of tissue through the active blade suction than to surgeon's experience.^{8,20,21}

Forty-one (85.4%) out of 48 of the BE group patients and all women of the HTRs experienced no discomfort to mild pain immediately after polypectomy. In an office setting, patient acceptability and procedural pain were linked to the duration of hysteroscopic surgery.^{21–23} Therefore, the reduction in the total operative time is of a high clinical significance for patient acceptability.²⁴ Seven (14.6%) women out of 48 of the BE group reported moderate pain (VAS score between 5 and 7). In all these cases polyps were located at the fundus of the uterine cavity or near the tubal ostium with an objective greater difficulty to use the BE without causing pain to the patient. None of the patients in the study experienced complications such as vasovagal reactions or excessive bleeding during the procedure.

All polyps removed at 1-year follow-up were confirmed as 'benign' by the pathologist. Despite the effects of tissue fragmentation, the removal of endometrial polyps using HTRs provided adequate tissue for pathological diagnosis, not decreasing the likelihood of identifying abnormal endometrial polyp disease.^{8,13,25}

In this study, we evaluated asymptomatic reproductive-age women with a single benign polyp after predictive risk factors associated with polyp recurrence were excluded. After a 1-year follow-up, office hysteroscopic endometrial polypectomy with small HTRs compared to BE revealed no difference in terms of complete removal and recurrence of polyps. HTRs polypectomy usually resulted in less pain and significantly quicker time of procedure compared to BE performed by a skilled surgeon.²⁰

Therefore, this data should be kept in mind for patient comfort any time hysteroscopic polypectomy is planned in an office setting.

Disclosure

S. B. has served as a consultant for Karl Storz Endoscopy, Germany. All the other authors declare that they have no conflicts of interest and nothing to disclose.

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Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Figure S1. Bipolar electrode (type Twizzle), Versapoint Bipolar Eletrosurgical System (Gynecare, USA) and grasping forceps in Continuous Flow Operative Hysteroscope 'size 4' (Karl Storz, Germany Storz).

Figure S2. TruClear 5C Hysteroscopic Tissue Removal system (HTRs) includes the hysteroscope set (rigid 0° hysteroscope with straight-through, D-shaped working channel with optic offset), the TruClear INCISOR device, the handpiece connected to a motor control unit and the footswitch.